CASE STUDY: LOW COST/HIGH VALUE PROGRAM

SYSTEM TYPE: Boilers, Compressed Air, Ovens, Steam, & Process

PROJECT FINANCIALS

- **Total Turnkey Installed Cost: $152,000**
- **Annual Energy Cost Savings: $306,784**
- **Simple Capital Payback: .5 years**
- **Average Project IRR: 200%**

LARGE HEAVY INDUSTRIAL Facility Embarks on Effort to Reduce Energy and Operations-Related Costs to Increase Profitability and Market Edge. Saves $307,000.

Situation

An energy intensive industrial facility needed to reduce their energy and operating related cost to increase profitability and market edge. The effort was centered around energy related opportunities, however, operating and production parameters were also considered. This allowed a focus on overall improvement for the facility and did not just limit the benefit of potential opportunities to their energy only components. The goal was to find opportunities that included both low cost and capital based opportunities for reducing in-facility operating costs. The effort included operational savings with very short paybacks and capital opportunities that had up to a 3 simple payback. The net overall program goal was to produce a combined simple payback of 2 years or less.

Methodology

The Facility Energy and Resource Management methodology utilizes a different approach than what is normally undertaken when looking for energy reduction opportunities. While the traditional approach is most often focused on developing capital based projects; this approach is more time intensive in the identification, analysis, and development stages, but typically produces much higher returns on investment. The process involves looking at the way facility systems operate from the energy, equipment, and efficiency perspective. This requires studying the operating parameters and methodologies to uncover opportunities for decreasing the combined energy, operating, and maintenance costs for the facility. This particular evaluation looked at items such as operating set points, shift to shift variation, equipment schedules, maintenance practices, and opportunities to install more efficient technology or equipment.

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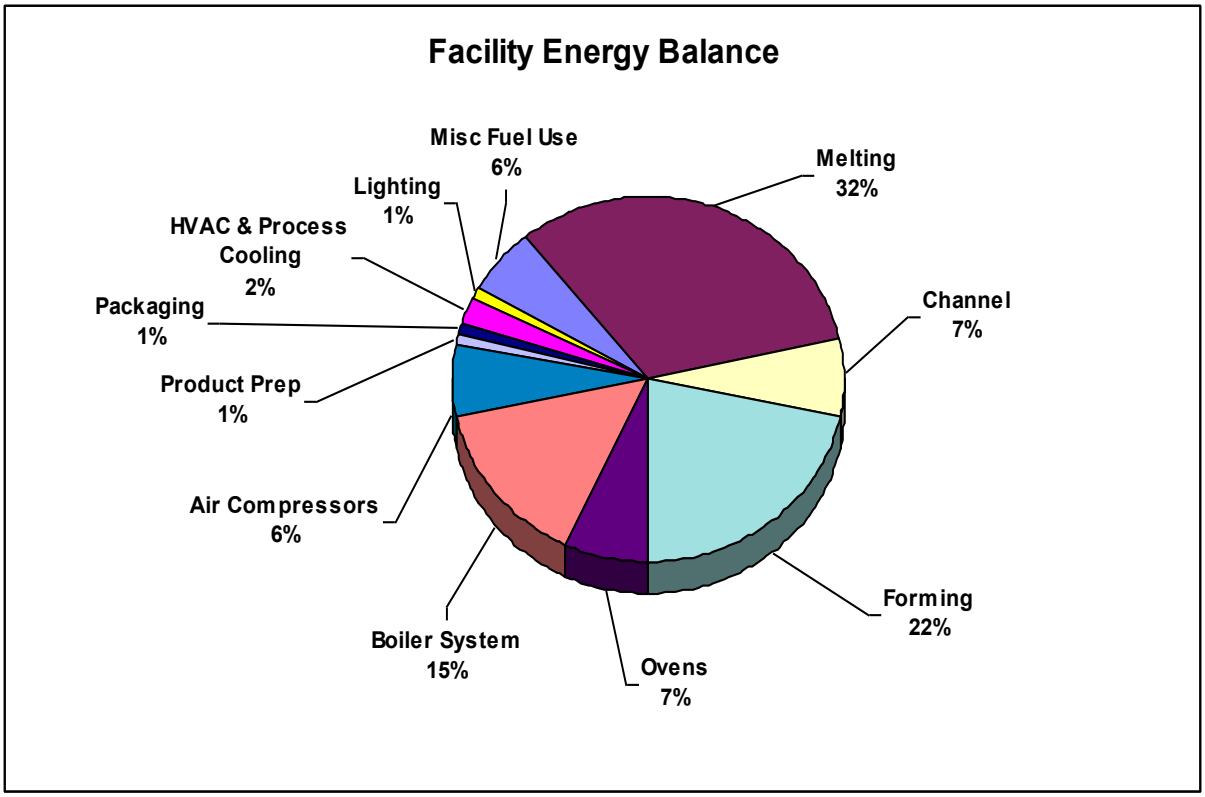
STEP 1

The first step in the analysis was to perform an energy balance to determine where the greatest opportunities existed. The energy balance provides information on how much energy is being consumed by the systems and established a "baseline" condition. The pie chart below shows the results of the facility energy balance. Although no systems were ignored, it is obvious that the large energy users provide the greatest potential for improvement and cost reduction.



STEP 2

The second step involved a preliminary identification of opportunities. As part of this step the opportunities were prioritized and reviewed with the facility personnel. The team then agreed upon which areas to focus on first. Opportunities given the highest priority were those providing the largest opportunity for savings which could be developed and implemented fairly quickly with minimal or no facility interruptions. Once those opportunities were in the development process first then the lower priorities were focused on.

STEP 3

The third step in the process was to perform the detailed development for the opportunities. This step provided the details necessary for implementation, including data gathering, monitoring if necessary, savings analysis, and implementation pricing. At the conclusion of the detailed development phase the opportunities were ready for final approval and implementation.

FINAL STEP

The final step in the process is the actual implementation of the opportunities. The implementation can take on several forms depending on the type of opportunity. In this case it included writing operational procedures and training operators to modify operating practices, the implementation of maintenance practices for systems such as compressed

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air. Implementation also included the installation of more efficient equipment such as boilers and heat recovery equipment. All of these types of opportunities provided the basis for the overall facility resource improvement and cost reductions.

Results

The results of the efforts in this case were first year cost reduction savings that exceeded the cost to develop and implement the opportunities. This facilities' return is higher than what would normally be expected with a more traditional approach and indicates what can be achieved by teaming up with Solution Dynamics to provide expertise, time, and effort required to perform a detailed analysis of all of the different aspects of the facilities energy and operational costs

Annual Energy Cost Savings = $306,784

Total Turnkey Installed Cost = $152,000

Simple Payback = ½ year

Averaged IRR = 200%

Summary of Some of the Implemented Energy Conservation Opportunities

The table below lists some of the general types of opportunities identified and implemented for this particular facility.

Compressed Air Systems	Implemented best practices, developed alternatives for "inappropriate uses", & better compressor sequencing.
Ovens	Burner tuning adjustments, oven balancing and control.
Boilers	Operational adjustments.
Steam System	Implemented best practices, & end use modifications.
Process Improvements	Equipment operational adjustments & enhanced process control, Improved shift to shift operational practice variations for increased efficiency.
Miscellaneous other systems	Low cost lighting improvements beyond simple lighting retrofit programs, Setpoint adjustments in various equipment, including tuning, control, and calibration improvements.